

All District Engineers, Walter S. Kos & Miguel d'Escoto

Michael L. Hine

Special Provision for Ground Granulated Blast-Furnace Slag in  
Portland Cement Concrete

September 28, 2001

This special provision was developed by the Bureau of Materials and Physical Research from work conducted by the PCC Technical Group Ground Granulated Blast-Furnace Slag Subcommittee. The special provision revises where GGBF slag can be used, reduces the minimum replacement ratio for Grade 100, and expands the year round use for GGBF slag. It has been updated for use with the 2002 Standard Specifications.

This special provision should be included on all concrete projects.

The districts should include the BDE Check Sheet marked with the applicable special provisions for the January 18, 2002 and subsequent lettings. The Project Development and Implementation Section will include the paper copy in the contract.

This special provision will be transferred through the E-mail System to the district offices on September 28, 2001.

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## GROUND GRANULATED BLAST-FURNACE SLAG IN PORTLAND CEMENT CONCRETE (BDE)

Effective: April 1, 1995

Revised: January 1, 2002

Add the following to Article 1020.05 of the Standard Specifications:

"(k) **Ground Granulated Blast-Furnace Slag.** At the Contractor's option, GGBF slag may partially replace portland cement in concrete mixtures, for Class BD, PV, MS, SI, SC and SH, except when blended cements are used. A mix design consisting of cement, GGBF slag, and fly ash may be used only when specified by the Department. For Class PP concrete, GGBF slag may be used according to Article 1020.04.

GGBF slag and all other materials proposed for portland cement concrete mix designs shall be furnished to the Engineer at least 60 days prior to the initiation of work. The Engineer may elect to waive the required mix designs if the proposed materials combination has been previously approved and has demonstrated satisfactory field performance.

The amount of cement replaced by GGBF slag shall not exceed 25 percent by mass (weight). The replacement ratio (GGBF slag:cement replaced) shall be a minimum of 1 to 1 for Grade 100 and 120. Measurements of GGBF slag and cement shall be rounded up to the nearest 2.5 kg (5 lb).

Mix design strength requirements for GGBF slag compensated mixes shall be according to Article 1020.04.

Requirements for opening the pavement and/or structures to traffic and removal of falsework shall be according to Articles 701.05 and 503.04 **respectively**, except a minimum of 28 days from time of placement shall elapse in the absence of strength tests.

Except for Class PP concrete, GGBF slag shall not be used in concrete mixtures when the air temperature is below 4 °C (40 °F) without permission of the Engineer. If permission is given, the mix design strength requirement may require the Contractor to reduce the quantity of GGBF slag, increase the cement, or eliminate the cement factor reduction for a water-reducing or high range water-reducing admixture which is permitted according to Article 1020.05(b)."